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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/555,617

11/04/2005

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EXAMINER

FOTAKIS, ARISTOCRATIS

ART UNIT

PAPER NUMBER

2611

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/555,617	<b>Applicant(s)</b> GAO ET AL.	
	<b>Examiner</b> ARISTOCRATIS FOTAKIS	<b>Art Unit</b> 2611	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 - 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :11/04/2005, 08/09/2007, 11/02/2009, 03/23/2010 .

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 5, 10 – 11 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Mantravadi et al (US 2005/0068918).

Re claims 1 and 19, Mantravadi teaches of a method for use in a receiver (Fig.8B), the method comprising: receiving a hierarchical modulation based received signal ({y1} or {y2}), the hierarchical modulation based signal comprising at least a first signal layer (base stream, Fig.8B) and a second signal layer (enhancement stream, Paragraphs 0005 - 0006); and simultaneously recovering from the received hierarchical modulation based received signal data conveyed in the first signal layer and data conveyed in the second signal layer (simultaneous decoding by decoders 846a and 846b as shown in Fig.8B, Paragraphs 0250 – 0251).

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Re claim 2, Mantravadi teaches of wherein the first signal layer is an upper signal layer and the second signal layer is a lower signal layer (Paragraphs 0005 - 0006).

Re claim 3, Mantravadi teaches of wherein the simultaneously recovering step includes the steps of: decoding the hierarchical modulation based signal to recover data conveyed in the first signal layer (#846a, Fig.8B); generating soft metrics (LLR) from the hierarchical modulation based signal as a function of a combined signal space of the hierarchical modulation based signal (842a and 842b); and decoding the hierarchical modulation based signal to recover data conveyed in the second signal layer as a function of the generated soft metrics (846b, Fig.8B).

Re claim 4, Mantravadi teaches of wherein the soft metrics are log-likelihood ratios (LLR, Paragraph 0251).

Re claim 5, Mantravadi teaches of wherein the combined signal space is a combination of a signal space of the first signal layer and a signal space of the second signal layer.

Re claim 10, Mantravadi teaches of a receiver comprising: a demodulator for demodulating a received signal to provide a hierarchical modulation based signal (#360b, Fig.8B, Paragraphs 0005 - 0006) comprising at least two signal layers (*base*

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*and enhancement streams*); a first decoder operative on the hierarchical modulation based signal for decoding one of the at least two signal layers to provide data therefrom (#846a, Fig.8B); and a second decoder for providing data from the other of the at least two signal layers (#846b, Fig.8B); wherein the second decoder operates independently of the first decoder (#846a and 846b are independent, Fig.8B).

Re claim 11, Mantravadi teaches of wherein the at least two signal layers include an upper signal layer and a lower signal layer (Paragraphs 0005 - 0006).

Claims 14 - 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al (US 2006/0056541).

Re claim 14, Chen discloses of an apparatus comprising: a television set for displaying video content (Paragraph 0007); and a receiver coupled to the television set for receiving a hierarchical modulation based signal conveying the video content, wherein the receiver simultaneously decodes at least two signal layers (HP and LP) of the received hierarchical modulation based signal for providing the video content to the television set (#210 and #220, Fig.2, Paragraphs 0031 - 0032).

Re claim 15, Chen discloses of wherein the received hierarchical modulation based signal is a satellite signal (Paragraph 0007).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mantravadi.

Re claim 18, Mantravadi teaches of an apparatus (Fig.8B) comprising: a simultaneous demodulator/decoder (360b/370b, Fig.8B) for processing a hierarchical modulation based received signal ({y1} and {y2}) comprising at least a first signal layer (base stream, yb1, yb2) and a second signal layer (enhancement stream, ye1, ye2, Paragraphs 0005 - 0006); and at least one device for use in controlling the simultaneous demodulator/decoder for simultaneously recovering from the hierarchical modulation based received signal data conveyed in the first signal layer and data conveyed in the second signal layer (TDM control, Figs 7A and 8B, Paragraphs 0181, 0185 and 0245). However, Mantravadi does not specifically disclose of a register for use in controlling the simultaneous demodulator/decoder. It officially noted that the use of registers is very well known in the art to store or hold information or signals so as to avoid recalculations.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a register to remember the TDM control and have it used for controlling the simultaneous demodulator/decoder.

Claims 7 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantravadi in view of Ling et al (US 2002/0097785) and further in view of Hewitt et al (US 2002/0026615).



Re claim 7, Mantavadi teaches of a method for use in a receiver for receiving a hierarchical modulation based signal comprising at least a first signal layer and a second signal layer, the method comprising: receiving a training signal from an endpoint (pilot signal #320, Fig.4A); calculating soft metric values as a function of a combined signal space (LLR, 842a, 842b), wherein the combined signal space is a combination of a signal space of the first signal layer and a signal space of the second signal layer (base stream (b) and enhancement stream (e), Paragraphs 0005 – 0006, 0250 - 0251). However, Mamtravadi does not specifically teach of calculating soft metric values as a function of the received training signal and storing the calculated soft metric values in a look-up table.

Ling teaches of a receiver comprising a LLR circuit that calculates soft metric values (LLR) as a function of the received data signal and the received training signal (pilot) (Fig.5).

Hewitt teaches of optimum decoding by computing LLR. The LLR is then stored in a ROM or other storage medium, and the LLR is calculated using a table lookup from the storage medium (Paragraph 0005).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the received pilot signal to calculate the LLR so as to determine the channel conditions and provide a more reliable LLR value. It would have been obvious to one having ordinary skill in the art at the time the invention was made

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to have stored the calculated LLR values in a look up table in order to avoid recalculations.

Re claim 8, Mantavadi teaches of receiving the hierarchical modulation based signal; decoding the hierarchical modulation based signal to recover data conveyed in the first signal layer (846a, Fig.8B); and decoding the hierarchical modulation based signal to recover data conveyed in the second signal layer (846b, Fig.8B) as a function of the stored metric values (as taught by Hewitt).

Re claim 9, Mantavadi teaches of wherein the soft metric values are log-likelihood ratios (LLR, Paragraph 0251).

Claims 6 and 12 - 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mantravadi in view of Hewitt et al (US 2002/0026615).

Re claim 12, Mandravati teaches all the limitations of claim 10 as well as the soft metrics (LLR) are determined as a function of a combined signal space of the at least two signal layers (842a, 842b, Fig.8B) and provides the soft metrics to the second decoder for use (846b) therein for providing the data from the other of the at least two signal layers (enhancement stream, Fig.8B). However, Mandravadi does not specifically teach of further including a look-up table for storing therein soft metrics and wherein the

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look-up table provides the soft metrics to the second decoder for use therein for providing the data from the other of the at least two signal layers.

Hewitt teaches of optimum decoding by computing LLR. The LLR is then stored in a ROM or other storage medium, and the LLR is calculated using a table lookup from the storage medium (Paragraph 0005).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have stored the calculated LLR values in a look up table in order to avoid recalculations and for achieving faster decoding.

Re claim 13, Mantravadi teaches of wherein the soft metrics are log-likelihood ratios (LLR, Paragraph 0251).

Re claim 6, Mandravati teaches all the limitations of claim 3 except of wherein the generating step includes the step of using the hierarchical modulation based signal as an index into a look-up table of soft metrics.

Hewitt teaches of optimum decoding by computing LLR. The LLR is then stored in a ROM or other storage medium, and the LLR is calculated using a table lookup from the storage medium (Paragraph 0005).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have stored the calculated LLR values in a look up table in order to avoid recalculations and for achieving faster decoding.

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Claims 16 - 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Hewitt.

Chen teaches all the limitations of claim 14 except of wherein the receiver includes a look-up table for storing soft metrics (LLR), which are determined as a function of a combined signal space of the at least two signal layers.

Hewitt teaches of optimum decoding by computing LLR. The LLR is then stored in a ROM or other storage medium, and the LLR is calculated using a table lookup from the storage medium (Paragraph 0005).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have stored the calculated LLR values in a look up table in order to avoid recalculations and for achieving faster decoding.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ARISTOCRATIS FOTAKIS whose telephone number is (571)270-1206. The examiner can normally be reached on Monday - Friday 6:30 - 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aristocratis Fotakis/

Examiner, Art Unit 2611

/CHIEH M FAN/

Supervisory Patent Examiner, Art Unit 2611